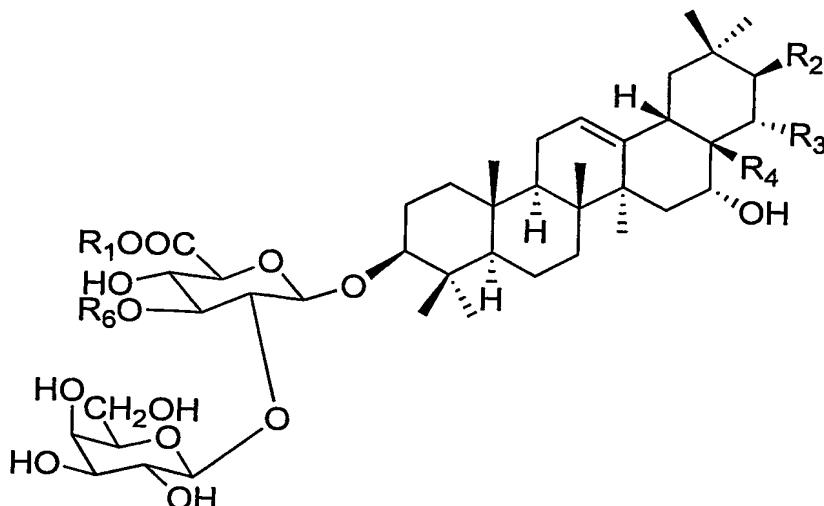


glycoside fraction was different to that produced by narcotics.

SUMMARY OF THE INVENTION

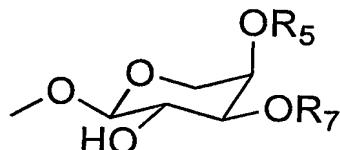
One aspect of the invention, and by no means the broadest form, provides for novel compounds of the formula (I)



5

wherein:

R<sub>2</sub> is selected from hydrogen, hydroxyl, O-alkyl, O-alkenyl, O-benzoyl, O- alkanoyl, O-alkenoyl, O-aryl, O-heterocyclic, O-heteroaryl or



10 wherein R<sub>5</sub> and R<sub>7</sub> are independently selected from hydrogen, alkanoyl, alkenoyl, benzoyl or benzoyl alkyl substituted alkanoyl;

R<sub>3</sub> is selected from hydroxyl, O-alkanoyl, O-alkenoyl, O-benzoyl, O-alkyl, O- alkenyl, O-aryl, O-heterocyclic or O-heteroaryl;

15 R<sub>4</sub> is selected from -CH<sub>2</sub>OH, COOH, CH<sub>2</sub>OCOCH<sub>3</sub>, COO alkyl, COO aryl, CH<sub>2</sub>COO alkyl, COO-heterocyclic, COO-heteroaryl, CH<sub>2</sub>-O aryl, CH<sub>2</sub>O heterocyclic or CH<sub>2</sub>O heteroaryl;

R<sub>6</sub> is selected from hydrogen or



R<sub>1</sub> is selected from hydrogen or alkyl; or  
pharmaceutically acceptable salts thereof, with the provisos that when:  
R<sub>2</sub> is OH, R<sub>3</sub> is OH, R<sub>4</sub> is CH<sub>2</sub>OH, and R<sub>6</sub> is xylopyranosyl, R<sub>1</sub> is not H;  
R<sub>4</sub> is CH<sub>2</sub>OH and R<sub>3</sub> is O-alkanoyl R<sub>2</sub> is not O-acetyl; :  
5 R<sub>4</sub> is CH<sub>2</sub>OH and R<sub>2</sub> is O-alkenoyl R<sub>3</sub> is not hydroxyl; and  
R<sub>4</sub> is CH<sub>2</sub>OH and R<sub>3</sub> is hydroxyl then R<sub>2</sub> is not hydroxyl.

The term "alkyl" refers to linear, branched, cyclic and bicyclic structures and combinations thereof, having 1 to 18 carbon atoms. Non-limiting examples of alkyl groups include methyl, ethyl, propyl, isopropyl, 10 butyl, s- and t-butyl, pentyl, hexyl, heptyl, octyl, nonyl, undecyl, dodecyl, tridecyl, tetradecyl, pentadecyl, cyclopropyl, cyclobutyl, cyclopentyl, cyclohexyl and the like. More preferably alkyl is selected from methyl, ethyl, propyl, isopropyl, butyl, s- and t- butyl, pentyl, and hexyl.

The term "alkenyl" refers to unsaturated linear or branched structures 15 and combinations thereof, having 1 to 7 carbon atoms. Non-limiting examples of alkenyl groups include, ethenyl, propenyl, isopropenyl, butenyl, s- and t-butenyl, pentenyl, hexenyl.

"Alkanoyl" means alkanoyl groups of a straight or branched configuration having 1-8 carbon atoms. Preferably alkanoyl is selected from 20 acetyl, propionoyl, butyryl, isobutyryl, pentanoyl and hexanoyl. More preferable alkanoyl is selected from acetyl, propionoyl, butyryl, and isobutyryl.

"Alkenoyl" means alkenylcarbonyl in which alkenyl is as defined above. Preferably alkenoyl is selected from pentenoyl, hexenoyl or 25 heptenoyl. More preferably alkenoyl is selected from petnenoyl (tigloyl) or hexenoyl (angeloyl).

The term "benzoyl alkyl substituted alkanoyl" is used to refer to straight or branched C1-C6 alkanoyl substituted with at least one benzoyl and at least one alkyl, wherein the benzoyl is attached to an straight or 30 branched C1-6 alkyl. Preferably a benzoyl alkyl substituted alkanoyl is benzoyl methyl isobutanoyl.

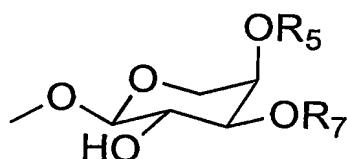
"Heterocyclic" refers to a non-aromatic ring having 1 to 4 heteroatoms

said ring being isolated or fused to a second ring selected from 3- to 7-membered alicyclic ring containing 0 to 4 heteroatoms, aryl and heteroaryl, wherein said heteroatoms are independently selected from O, N and S. Non-limiting examples of heterocyclic include pyrrolidinyl, piperidinyl, piperazinyl, morpholinyl, tetrahydrofuranyl, imidazolinyl, thiomorpholinyl, and the like.

5 "Aryl" means a 6-14 membered carbocyclic aromatic ring system comprising 1-3 benzene rings. If two or more aromatic rings are present, then the rings are fused together, so that adjacent rings share a common bond. Examples include phenyl and naphthyl. The aryl group may be  
10 substituted with one or more substituents independently selected from halogen, alkyl or alkoxy.

15 The term "heteroaryl" as used herein represents a 5-10 membered aromatic ring system containing a single ring having 1-4 heteroatoms, selected from O, S and N. Heteroaryl includes, but is not limited to, furanyl, diazinyl, imidazolyl, isooxazolyl, isothiazolyl, pyridyl, pyrrolyl, thiazolyl, triazinyl and the like.

Preferably R<sub>2</sub> is hydrogen, O-benzoyl, O-tigloyl, or



20 wherein R<sub>5</sub> and R<sub>7</sub> are selected from hydrogen, tigloyl, benzoyl, or benzoyl alkyl substituted alkanoyl.

Preferably R<sub>3</sub> is selected from hydroxyl, O-acetyl, O-benzoyl, O-isobutyryl or O-tigloyl.

Preferably R<sub>4</sub> is selected from -CH<sub>2</sub>OH, O-acetyl or hydroxyl.

Preferably the compound of formula (I) is selected from;

25 a. 3-O- $\beta$ -D-xylopyranosyl(1 $\rightarrow$ 3)-[ $\beta$ -D-galactopyranosyl(1 $\rightarrow$ 2)]- $\beta$ -D-glucuronopyranosyl-21-O-[3-(3-benzoyl-2-methylbutanoyl)-4-benzoyl- $\alpha$ -L-arabinopyranosyl]-22-O-acetyl barringtogenol C;  
b. 3-O- $\beta$ -D-xylopyranosyl(1 $\rightarrow$ 3)-[ $\beta$ -D-galactopyranosyl(1 $\rightarrow$ 2)]- $\beta$ -D-glucuronopyranosyl-21-O-benzoyl barringtogenol C;

**Aglycones.**

**Compound F70.2.5.2:** - This compound was isolated as 7.2 mg of an amorphous white powder.

A compound related to F70.2.5.2,  $2\alpha,3\beta,19\alpha$ -trihydroxy-olean-12-ene-23,28-dioic acid 28-O- $\beta$ -D-glucopyranoside, was previously isolated from *Barringtonia acutangula* [1]. This compound differs from F70.2.5.2 in that the acid at C<sub>28</sub> has a glucopyranoside moiety. Therefore the present compound is  $2\alpha,3\beta,19\alpha$ -trihydroxy-olean-12-ene-24, 28-dioic acid (FIG 48).

A second aglycone (F70.2.5.3) was isolated in the current project as 1.4 mg of a white substance. The mass of the compound was *m/z* 485.2912 ([M – 1]), which is consistent with the molecular formula C<sub>30</sub>H<sub>46</sub>O<sub>5</sub> (calculated *m/z* 486.3345). This suggests the loss of two hydroxyl groups from F70.2.5.2, however insufficient material could be obtained to provide further structural information.

**Monodesmosides** - The monodesmosidic compounds described in the following section are grouped according to the functionalities present at C<sub>21</sub> and C<sub>22</sub> of the aglycone.

**Benzoate at C<sub>21</sub> and hydroxyl at C<sub>22</sub>.**

Compounds F70.2.3.2 and F70.3.2 were shown to have a benzoate moiety at C<sub>21</sub> and a hydroxyl group at C<sub>22</sub>. Both were isolated as amorphous white solids in low yield (8.5 and 26.3 mg respectively).

**Benzoate at C<sub>21</sub> and iso-butyrate C<sub>22</sub>.**

**Compound F70.3.4.2** - This compound was isolated as 11.7 mg of an amorphous white powder.

**Benzoate at both C<sub>21</sub> and C<sub>22</sub>:** Compounds in this group each had a benzoate functionality at both C<sub>21</sub> and C<sub>22</sub>. Four such compounds were isolated in the current project. Each of the four compounds were isolated as amorphous white substances and the weights were F70.4.3.5.2 (2.7 mg), F70.4.2.4.2 (4.9 mg), F80.6.4 (11.7 mg) and F80.6.7 (3.9 mg).

**Benzoate at C<sub>21</sub> and tiglate at C<sub>22</sub>.** - The compounds in this group were characterised by a benzoate at C<sub>21</sub> and a tiglate at C<sub>22</sub>. Four such